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PARSONS HSUE & DE RUNTZ LLP
655 MONTGOMERY STREET
SUITE 1800
SAN FRANCISCO, CA 94111

EXAMINER

MONDT, JOHANNES P

ART UNIT PAPER NUMBER

2826

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/773,943

Applicant(s)

LEE ET AL.

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 34-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 and 39-44 is/are rejected.
- 7) ☒ Claim(s) 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/21/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of the Group I invention (claims 1-33 and 39-044) in the reply filed on 6/13/05 is acknowledged. Accordingly, claims 34-38 are being withdrawn from consideration.

Information Disclosure Statement

The examiner has considered the items listed in the Information Disclosure Statement filed 3/21/05. A signed copy of Form PTO-1449 (two pages) is enclosed with this Office Action.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the separation of the substrate from both the first and second structure (only part of the first structure is shown to meet the claimed subject matter in this regard) as recited in claim 33 must be shown or the feature canceled from the claim. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

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changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following is a quotation from the relevant sections of the Patent Rules under 37 C.F.R. 1.75 that form the basis of the objection made in this office action.

(d)

(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description (see § 1.58(a)).

The Specification is objected to for not disclosing the subject matter of ***claim 33***: nowhere in the Specification do Applicants teach the substrate to be separated from the active by the first structure *and the second structure*. Applicant should provide proper disclosure without introducing any new matter or remove the undisclosed subject matter from the claim. The objection to the Specification will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claim 20** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. In particular, the only explanation of the chosen ratio of the width of said portion of electrode divided by a side of the hexagonal openings (a) refers to a theoretical calculation that is neither provided nor illustrated and that, moreover, (b) only pertains to a case specifically excluded from the invention as claimed, because according to claim 14 on which claim 21 depends (through 18, 17 and 16) there are indeed holes beneath the electrode, while the absence of holes underneath the electrode was assumed in the theoretical calculation (see page 10 of the Specification, par. [0025]). Because of the claimed presence of holes underneath the electrode the latter evidently matter and the theoretical calculation cannot reasonably be relied upon.

6. **Claim 30** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the disclosure in par. [0022] teaches a range from 1 μm – 100 μm for the photonic cell range and nowhere in the Specification is there any disclosure of a more preferred range. Therefore, the disclosure *contradicts* the preferred status of the range as claimed.

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claim 5** recites the limitation "the at least one semiconductor layer" in line 2.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1-4, 6, 31-32 and 39- 41** are rejected under 35 U.S.C. 102(b) as being anticipated by Hirayama et al (5,970,081). Hirayama et al teach a solid state light emitting device (title, abstract and "Brief Summary of the Invention" cols. 4-5) comprising: an active layer 113 emitting light in response to current injected into the layer (col. 5, l. 53-65); a first structure 114 adjacent to the active layer (col. 5, l. 59-60), said structure trapping the light by the active layer (inherently so, because waveguide layers have a higher refractive index than the adjacent cladding layers, which is why they guide the electromagnetic waves; see also col. 6, l. 18-23); and a second structure 115 (col. 5, l. 61-63) adjacent to the first structure 114 extracting the light that is trapped by the first structure (col. 6, l. 23-25). In conclusion, Hirayama et al anticipate claim 1.

On claim 2: the first structure contains substantially a single optical mode or a few lower-order optical modes (because the solid state light emitting device is a laser: see abstract, first sentence), and traps the light in said optical mode (being waveguide layer in laser).

On claim 3: the first structure comprises at least one waveguide layer 114 (loc.cit.).

On claim 4: the at least one waveguide layer has a thickness in the range as claimed, namely 100 nm (col. 5, l. 59-60).

On claim 6: the device further comprises at least one cladding layer 116 (col. 5, l. 66) adjacent to the waveguide layer, said cladding layer having an index of refraction lower than that of the waveguide layer (inherently so, because otherwise the light would not be guided through reflection at the interface between the cladding layer and the waveguide layer).

On claim 31: the device by Hirayama et al further comprises a substrate layer 111/112 (col. 5, l. 61)

On claim 32: at least through cladding substrate layer 112 but also through the material constitution of the lowest substrate layer 111, being identical to that of cladding layer 112, has a band gap that is wider than that of the active layer (col. 5, l. 53-65); it is noted in this regard that said wider band gap is both necessary and sufficient for the very role of the cladding layer and hence is an inherent property thereof.

On claims 39, 40 and 41: The devices of claims 1, 2 and 3 would necessarily have to be formed in order to function. Claims 39, 40 and 41 fail to further limit the devices of claims 1, 2 and 3 other than simply form each of their components.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 5, 7, and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al (5,970,081) in view of Kung et al (6,420,732 B1). Subject to the rejection under 35 U.S.C. 112, second paragraph of claim 5 provided above, and assuming Applicant intends to claim an transparent conductive layer over the at least one waveguide layer the following rejection based on obviousness must be given:

As detailed above, Hirayama et al anticipate claim 3. Hirayama et al do not necessarily teach the further limitation that the device further comprises a transparent conductive layer over the at least one waveguide layer. However, it would have been obvious to include said further limitation in view of Kung et al, who, in a patent on a light emitting diode with improved light extraction efficiency (see title and abstract), hence closely related to Hirayama et al, teach the inclusion of a transparent and conductive layer 52 (Figure 4 and col. 10, l. 13-27). Motivation to include the teaching by Kung et al in the invention by Hirayama et al derives from the beneficial effect of transparency of an electrode in the path of light to be extracted, given the common objective of light extraction improvement (title in Kung et al, and col. 1, l. 5-10 in Hirayama et al). Combination is easily achieved by selecting ITO as the material of choice for electrode 119 in Hirayama et al.

With regard to *claim 7*, Hirayama et al anticipate claim 6, as also detailed above. Hirayama et al do not necessarily teach the further limitation defined by claim 7. However, it would have been obvious to include a indium tin oxide (ITO) layer over the

at least one cladding layer in view of Kung et al, who, in a patent on a light emitting diode with improved light extraction efficiency (see title and abstract), hence closely related to Hirayama et al, teach the inclusion of a transparent and conductive layer 52 (Figure 4 and col. 10, l. 13-27), the only material being cited in this regard being ITO (indium tin oxide) (see col. 4, l. 36-43). *Motivation* to include the teaching by Kung et al in the invention by Hirayama et al derives from the beneficial effect of transparency of an electrode in the path of light to be extracted, given the common objective of light extraction improvement (title in Kung et al, and col. 1, l. 5-10 in Hirayama et al). Combination is easily achieved by selecting the ITO layer, in composition and thickness, (for transparency) for electrode 119 in Hirayama et al.

With regard to claim 8: furthermore, ITO inherently is electrically conductive, substantially transparent and has an index of refraction of about 1.8 while said ITO layer when replacing 119 in Hirayama et al has the structural capability to serve as interface of the LED with air or other media, forming an edge component thereof (Figure 1B).

12. **Claims 9 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al and Kung et al as applied to claim 7 above, and further in view of Moller et al (US 2003/0020399 A1). As detailed above, claim 7 is unpatentable over Hirayama et al in view of Kung et al, neither necessarily teaching the thickness range for the ITO layer as claimed. However, it would have been obvious to select the thickness within said range in view of Moller et al, who, in a patent application on intensity enhancement of the light emitting device (title), hence closely related to Hirayama et al, teach the thickness of the anode electrode, chosen to be of ITO inter

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alia for transparency, to be 100 nm (see [0004]), which falls in the range of 30 nm – 300 nm (claim 9), and within the ranges 89 nm – 640 nm and 65 nm – 470 nm (claim 10).

Applicant is furthermore reminded that a *prima facie* case of obviousness typically exists when the ranges as claimed overlap the ranges disclosed in the prior art or when the ranges as claimed do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003). *Motivation* for the selection of the thickness within said range stems at least from the requirements of transparency and conductance.

13. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al and Kung et al as applied to claim 7 above, and further in view of Fukuoka et al (US 2001/0000943 A1). Although neither Hirayama et al nor Kung et al necessarily teach the further limitation defined by claim 11 it would have been obvious to include said further limitation in view of Fukuoka et al, who in a patent application drawn to light emitting devices with transparent (ITO) electrodes teach the selection of the thickness of the transparent electrodes to be in the preferable range of 10 nm – 200 nm for ITO (see par. [0154]), hence $n = 1.8$, and for a peak wavelength of about 470 nm (see Figure 6; see par. [0105]), yielding approximately 60 nm for $\lambda / (4n_{ITO})$, which is centrally located in said preferable range for the ITO electrode thickness, thus meeting the range as claimed, namely the range “substantially equal to $\lambda / (4 n_{ITO})$ ” within the prior art range. Applicant is reminded that it has been held that a *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art or when the ranges of a claimed composition do not

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overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

14. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al and Kung et al as applied to claim 7 above, and further in view of Chu et al (US 2002/0117672 A1). Although neither Hirayama et al nor Kung et al necessarily teach the further limitation defined by claim 12, it would have been obvious to include said further limitation in view of Chu et al, who, in a patent application drawn to a light-emitting device with improved light extraction (see title and abstract) teach the inclusion underneath the transparent ITO electrode layer of a ohmic-contact-enhancing thin Ni/Au layer (see abstract), so as to be able to increase light extraction (through the transparent ITO layer while the Ni/Au layer is made to be extremely small (see abstract) while decreasing the contact resistance through inclusion of said Ni/Au layer (see abstract). *Motivation* to include the teaching by Chu et al thus derives from the improved ohmic contact resistance while the light extraction efficiency is not significantly compromised.

15. **Claims 13-17, 28-29 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al in view of Joannopolulos et al (5,995,749) (see Information Disclosure Statement: made of record by Applicant). As detailed above, Hirayama et al anticipate claim 1. Hirayama et al do not necessarily teach the further limitation defined by claim 13. However, in the art of light extraction from light emitting devices it would have been obvious to include said further limitation in view of Joannopoulos et al, who teach a layer of photonic crystal cells 22 (abstract, Figure 2A

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and col. 4, l. 55-67) (claim 13) with arrays of holes 24 (col. 5, l. 1-8) (claim 14) to enhance extraction of radiation from said light emitting device (loc.cit.). Motivation immediately derives from the resulting improved extraction efficiency taught by Joannopoulos (col. 2, l. 7-18), which also is a major objective of Hirayama et al (see, e.g., the abstract). In the combined invention said second structure, comprising the photonic crystal 22 comprises at least one layer (layer 22), wherein the photonic crystal cells comprise at least one array of holes 24 in said at least one layer (loc.cit.) (claim 15). Said array of holes forms a two-dimensional array of holes (claim 16), while in any semiconductor light-emitting device is comprised at least one electrode layer through which current is injected into the active layer: see for instance Hirayama et al, col. 5, l. 66 – col. 6, l. 6, p-side electrode 116 and n-side electrode 118 (claim 17). With regard to claim 28: Joannopoulos et al teach both a rectangular array and a triangular array of holes (Figure 6 and col. 5, l. 1-28). With regard to claim 29: the lattice constant “a” of the array of holes (see Figure 2A and col. 5, l. 5-6) and the diameter of the holes (0.45 a: see col. 5, l. 5-6) substantially overlap in Joannopoulos et al with the values in the ranges as claimed because according to Figure 1B the frequency range of the emitted light, dependent upon said lattice constant “a”, would otherwise fail to be in the visible range (col. 3, l. 62-65).

On claim 42: The device of claim 13 would necessarily have to be formed in order to function. Claim 13 fails to further limit the devices of claim 13 other than simply form its components.

16. **Claims 18-19 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al and Joannopoulos et al as applied to claim 17 above, and further in view of Kung et al (6,420,732 B1). *As detailed above, claim 17 is unpatentable over Hirayama et al in view of Joannopoulos et al. Neither necessarily teach the further limitation on grid-shaped pattern or pattern with hexagonal openings according to claim 18.* However, it would have been obvious to include said further limitation in view of Kung et al, who teach the electrode layer 52 to have a grid-shaped pattern conforming the pattern of the underlying contact layer with holes collinear with the holes therein to "further reduce the absorption of light" (col. 10, l. 12-28 in Kung et al: see Figures 4 and 24-26). *Motivation* thus derives at once from the improved extraction efficiency, which is the goal of Hirayama et al. In the combined invention thus obtained claim 19 is met, because the second structure comprises a plurality of holes, each array located so that it is enclosed by a grid cell or exposed through a hexagonal opening (both apply: see Joannopoulos et al, col. 5, l. 1-8) in said at least one patterned electrode layer, wherein each array extracts light from the first structure and causes the extracted light to escape through a corresponding hexagonal opening (60 in Kung et al; cf. Figures 6, 24-26) of the electrode layer, or an area bounded by adjacent strips 52 of a grid-shaped electrode layer (loc.cit.). With regard to claim 21, a triangular array is the inherent property of a photonic crystal with hexagonal holes as without said triangular array no translational invariance can be preserved, said translational invariance being a criterion for crystal property.(Bravais lattice).

17. **Claim 22-26 and 43-44** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al, Joannopoulos et al and Kung et al as applied to claim 18 above, and further in view of Baur et al (WO 01/91194 A1). Although neither Hirayama et al, nor Joannopoulos et al, nor Kung et al necessarily teach the further limitation as defined by claim 22, it would have been obvious to include said further limitation in view of Baur et al, who, in patent application drawn to a light-emitting device (abstract), hence closely related to the combined invention, teach the electrode layer 6 (page 14, lines 27-37) to comprise elongated strips forming a network (loc.cit.), wherein the width of the strips is in the range as claimed, namely 3 μm (loc.cit.), so as to increase the external quantum efficiency (see abstract) further by allowing a reduction of the portion of surface area covered by the electrode layer. *Motivation* immediately flows from the resulting increase in light yield.

On claims 23-25: although Hirayama et al, Joannopoulos et al and Kung et al do not necessarily teach the further limitation defined by claim 23 it would have been obvious to include said further limitation in view of Baur et al, who teach said LED to comprise a plurality of light emitting portions (in between the members of the mesh: see page 14, lines 27-37) or semiconductor chips, said at least one electrode layer comprising a network (page 14, line 35) on each chip enclosing at least one light extraction cell (necessarily defined here to be the cell with the nearest members of the electrode mesh as boundaries) so as to provide in spite of the need for providing electrical contact an increase in the light extraction efficiency (see abstract). When included in the combined invention said light extraction cells are the photonic crystal

cells because light extraction takes place exclusively within the latter. In the combined invention including the teaching by Baur et al said network comprises a plurality of grid cells (units of the mesh), each enclosing a photonic crystal cell (claim 24), while the mesh is taught to be rectangular (see Figures 7 and 8) (claim 25), and while each grid cell has a dimension in a range substantially overlapping the range defined by claim 26, namely within $0.1\ \mu\text{m} - 1\ \text{mm}$, being $3\ \mu\text{m}$ (page 14, lines 35-36). Applicant is reminded in this regard that a *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art or when the ranges of a claimed composition do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

Motivation to include the teaching by Baur et al thus immediately flows from the resulting increased light extraction efficiency.

On claims 43-44: The device of claims 22 and 23 would necessarily have to be formed in order to function. Claims 43 and 44 fail to further limit the devices of claims 22 and 23 other than simply form their components.

18. **Claim 27** rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al and Joannopoulos et al as applied to claim 17 above, and further in view of Kung et al (6,420,732 B1). As detailed above, claim 1 is unpatentable over Hirayama et al and Joannopoulos et al, neither necessarily teaching the further limitation defined by claim 27. However, it would have been obvious to include said further limitation in view of Kung et al, who teach to include a central electrode layer portion 53 of transparent oxide

layer 52 (said portion 53 qualifies on its own as "said at least one electrode layer") so as to provide an improved current blocking structure (col. 11, l. 3-19). Motivation to include the teaching by Kung et al derives from the increase in current arriving at the light-producing pn-junction (loc.cit.).

Allowable Subject Matter

19. **Claim 33** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: notwithstanding the lack of disclosure as pointed out in the objection to the Specification detailed above, claim 33 would be allowable if said objection is removed, without introducing new matter, because strictly within the context of the invention defined by claims 1 combined with claim 31 the limitation of a substrate separated from the active, i.e., light-emitting, layer by the first structure (trapping the light) and the second structure (for light extraction) has not been found in the prior art to date.

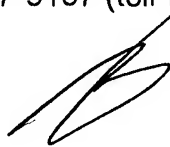
Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JPM
July 23, 2005

Patent Examiner:



Johannes Mondt (Art Unit: 2826).